

RAND

*Recent Recruiting
Trends and Their
Implications*

*Preliminary Analysis
and Recommendations*

Beth J. Asch, Bruce R. Orvis

19950206 145

Arroyo Center
National Defense
Research Institute

DTIC QUALITY INSPECTED 6

This research described in this report was sponsored by the United States Army under Contract No. MDA903-91-C-0006 and by the Office of the Secretary of Defense under RAND's National Defense Research Institute, a federally funded research and development center supported by the Office of the Secretary of Defense, the Joint Staff, and the defense agencies, Contract No. MDA903-90-C-0004.

ISBN: 0-8330-1628-8

RAND
Copyright © 1994

RAND is a nonprofit institution that helps improve public policy through research and analysis. RAND's publications do not necessarily reflect the opinions or policies of its research sponsors.

Published 1994 by RAND
1700 Main Street, P.O. Box 2138, Santa Monica, CA 90407-2138
To order RAND documents or to obtain additional information, contact
Distribution Services: Telephone: (310) 451-7002; Fax: (310) 451-6915;
Internet: order@rand.org.

RAND

*Recent Recruiting
Trends and Their
Implications*

*Preliminary Analysis
and Recommendations*

Beth J. Asch, Bruce R. Orvis

*Prepared for the
United States Army and the
Office of the Secretary of Defense*

**Arroyo Center
National Defense
Research Institute**

PREFACE

Because of RAND's extensive background in recruiting research, in spring 1994 the Army Chief of Staff and the Deputy Secretary of Defense asked for an evaluation of recent recruiting trends and their implications. The requests came as a result of mixed indications in the recruiting market. Although the Department of Defense (DoD) consistently has met its accession requirements since the beginning of the defense drawdown, the indicators raised some concerns, particularly for the longer term. This report provides the results of the preliminary steps of RAND's analysis, which were briefed widely last spring.

The work reported here draws extensively on previous RAND research on recruiting. The current effort was conducted within the Manpower and Training Program, part of RAND's Arroyo Center, and within the Forces and Resources Policy Center, part of RAND's National Defense Research Institute. The Arroyo Center and the National Defense Research Institute are both federally funded research and development centers, the first sponsored by the U.S. Army and the second by the Office of the Secretary of Defense and other DoD elements.

Accession For	
FTIS GRA&I	<input checked="checked" type="checkbox"/>
DTIC TAB	<input type="checkbox"/>
Unannounced	<input type="checkbox"/>
Justification	
By	
Distribution/	
Availability Codes	
Dist	Avail and/or Special
A-1	

CONTENTS

Preface	iii
Figures	vii
Tables	ix
Summary	xi
Acknowledgments	xv
Chapter One	
INTRODUCTION	1
Chapter Two	
TRENDS IN PROPENSITY TO ENLIST	5
The Link Between Stated Propensity and the Probability of Enlisting	6
The Effect of Changes in Positive Propensity Level on Enlistment Supply	8
Recent Trends in Propensity to Serve in the Military	10
Implications for Recruiting Success	14
Chapter Three	
DETERMINANTS OF ENLISTMENT SUPPLY	17
Enlistment Determinants.	17
How the Determinants Affect Enlistments	19
Other Factors Affecting the Optimal Mix of Recruiting Resources	22
Trends in Enlistment Determinants and Their Implications	24

vi Recent Recruiting Trends and Their Implications

Chapter Four	
CONCLUSIONS AND RECOMMENDATIONS	27
Bibliography	29

FIGURES

1. Conceptual View of Enlistment Process	3
2. Military Testing and Enlistment Rates According to Self-Reported Intention Level	7
3. Distribution of Intentions in Youth Population and Among Enlistees	8
4. Published and Reestimated Trends in Positive Propensity	10
5. Positive Propensity Trends for High-Quality Youth . . .	12
6. Positive Propensity Trends by Service	13
7. Enlistment Trends Since Fiscal Year 1978	20

TABLES

1. Enlistment Supply-to-Demand Ratio, Relative to 1989	15
2. Estimated Increase in High-Quality Recruits Resulting from a 10 Percent Increase in Supply Factors	21
3. Estimated Marginal Cost of a High-Quality Recruit Using Alternative Recruiting Resources	23
4. Recent Changes in Factors Affecting Enlistment	24
5. Implications of Recent Factor Changes for High-Quality Army Recruiting	25

SUMMARY

The Department of Defense (DoD) has consistently met its accession requirements since the beginning of the drawdown in the armed forces. However, certain indicators have raised some concerns, particularly for the longer term. The services are reporting increased difficulty in meeting their monthly enlistment contract goals, which include not only persons who will access within 30 days but those accessing in the next two to twelve months. This could portend future shortages. Moreover, according to DoD, the proportion of youth indicating that they are likely to enlist in the future has fallen sharply since the beginning of the drawdown. It is important to determine whether such indicators presage a serious reduction in enlistment supply. This concern is heightened by the fact that accessions were reduced well below the level required to sustain the armed forces during the drawdown. Accessions will increase substantially as the drawdown comes to an end in 1996.

We took two approaches to analyzing trends in enlistment supply. In the first, we reanalyzed DoD's enlistment propensity data. In so doing, we restricted ourselves to the high-quality enlistments that DoD values the most, and we adjusted for an inconsistency in the methodology underlying the reported data. We applied to these results an extensive body of RAND research translating reported intention levels into actual enlistment rates. Based on these analyses, we found that the propensity for the high-quality youth market—and, thus, supply—has not declined substantially relative to predrawdown levels. Taking into consideration the reduction in the requirement for high-quality nonprior-service accessions caused by the drawdown, we further found that supply (relative to the ac-

cession requirement) should continue to be greater than it was at the start of the drawdown, assuming that propensity remains near its recent levels.

In the second approach, we combined econometric estimates of the effects of various supply determinants (compiled from earlier RAND research) with trends in those determinants over the last several years. Again, we found that, taken together, these trends and effects suggested an expanded enlistment supply, not a contracted one. The results of our propensity analysis and our econometric-based analysis of specific supply and demand factors were thus consistent: They both suggest an adequate potential supply of enlistees.

Given these results, what then accounts for the reported difficulties? We see at least two possibilities. One is that the difficulties could come from changes in fundamental, underlying attitudes toward the military resulting from the end of the Cold War and related changes in the military force structure and mission. In theory, such changes—if large enough—could affect the enlistment-related advice given to youth by key influencers—such as parents—and youth’s own perceptions in ways that would diminish both propensity and enlistments, and, more generally, could affect the relationship between the variables in our models and enlistment rates. However, these models were developed over many years, economic conditions, and political climates, and, therefore, we believe they are robust against this possibility. Moreover, the strength and consistency of our results suggest that the changes in underlying attitudes would need to be very large to alter the results significantly. Further, if attitudes were worsening to that extent, reported propensities to enlist should be declining substantially, and we do not see such a trend. Thus, while additional research on attitudes would be helpful, we do not consider this explanation probable.

It is quite likely, on the other hand, that important changes in resource management or recruiting practices could have been made to cope with the substantial reduction in recruiting resources made during the drawdown. Such changes could affect recruiters’ ability to capture the market. Indeed, past research has shown that such “demand side” changes can have powerful effects on recruiting success. If real, such changes could be contributing in important ways to the reported difficulties.

Further study to verify the preliminary supply findings and investigate demand-side changes clearly is required; we recommend in the interim a hedging strategy to ensure that the proper resources are in place to meet current needs and the coming increases in the annual accession requirement. Such a strategy could include increases in advertising and the removal of the ceiling on the number of recruiters. RAND research indicates that advertising and recruiters are highly cost-effective recruiting resources. The implementation and the effects of any increases in advertising or in the number of recruiters should be carefully monitored to ensure the cost-effectiveness of this policy response.

ACKNOWLEDGMENTS

We would like to express our gratitude to LTG Theodore Stroup, MG Frederick Vollrath, and LTC James Thomas of the Office of the Army Deputy Chief of Staff for Personnel and to Dr. W. S. Sellman, LtCol Karen Dunivin, and Capt Dana Lindsley of the Office of the Secretary of Defense's Accession Policy Directorate, our sponsors. We also are grateful to the Defense Manpower Data Center and, in particular, to Dr. Jerome Lehnus, Mrs. Randolph Lougee, and Mr. Thomas Ulrich for their continued support in providing data and analysis for this research. Thanks also are due to the U.S. Army Recruiting Command for its cooperation in providing recruiting information. We also would like to express our gratitude to our RAND colleagues Jeanne Heller, for her helpful editing of this manuscript, James Dertouzos, for his thoughtful review, James Chiesa, who helped with an early version of this report, and Frances Teague, for her skill and patience in helping to finalize it.

Chapter One

INTRODUCTION

The Department of Defense (DoD) has consistently met its accession requirements since the beginning of the drawdown in the armed forces. However, in spring 1994 certain indicators raised concerns, particularly for the longer term. First, the services are reporting increased difficulty in meeting monthly accession goals, as well as in meeting the targeted number of enlistments into the Delayed Entry Program, which provides a pool of enlistees who will access during the next 12 months. Consequently, contract goals—which represent both near-term accessions (enlistees who ship out within 30 days) as well as contracts into the Delayed Entry Program—are consistently missed. The Army, for example, generally has fallen below its desired monthly number of enlistment contracts since the beginning of FY93 (averaging about 85 percent of the desired goal from mid-FY93 to mid-FY94), and the Navy has fallen below its goal about half the time (averaging about 90 percent of the goal from mid-FY93 to mid-FY94). This could portend future difficulties.

A second source of concern is a major decline in enlistment propensity—the proportion of youth indicating they are likely to join the military in the future—reported in the Youth Attitude Tracking Study since the beginning of the drawdown. As will be seen shortly, however, the reports appear to overstate the actual decline in propensity for the primary youth recruiting market (“high-quality” youth),¹ and the trend varies by service.

¹“High-quality” youths have high school diplomas and score in the upper half of the (nationally standardized) distribution on the written test to qualify for military service (Armed Forces Qualification Test or AFQT). It has been shown that such youths are

Part of the reason for concern about the recruiting outlook involves a substantial increase in the future accession mission. DoD cut accessions below the sustaining level during the drawdown to minimize the number of people who had to be induced to leave the armed forces. When the programmed drawdown ends, the accession numbers must be increased to the level required to sustain the force. The desired accession numbers are adjusted periodically. At mid-FY94 when RAND's assistance was requested, the FY96 plan called for an approximate 15 percent increase in nonprior-service accessions into the active force for the DoD as a whole, relative to FY94. The magnitude of the increase required by each service is roughly proportional to the magnitude of its drawdown; the Army's accession requirement was to increase by more than 30 percent, the Air Force's by up to 20 percent, and the Marine Corps's by about 10 percent.

In this report, we present the results of a preliminary analysis of recent recruiting trends and their implications, carried out in response to the request for RAND's help. We take two approaches to analyzing the prospects for meeting accession requirements. The first, discussed in Chapter 2, involves the analysis of enlistment propensity. The second, in Chapter 3, uses past estimates of the effects of specific supply and demand factors on enlistments, including unemployment rate, wages, advertising, number of recruiters, and recruiting goals and incentives, among others. We will examine how the indicators in each area relate to recruiting success and what the recent trends are. We conclude by making some initial recommendations.

First, it will be useful for understanding both approaches to quickly review how the enlistment process might be conceptualized. Figure 1 shows how propensity to enlist, labor market and recruiting resource factors, societal attitudes toward the military, and recruiter and resource management factors relate to recruiting success and to each other. Propensity is an overall measure of potential enlistment supply that summarizes the influence of a variety of factors on youths' interest in joining the military. These factors include others' attitudes toward the military and the benefits offered by military

less likely to leave the military before their terms end and have superior training and job performance capabilities.

RAND MR549-1

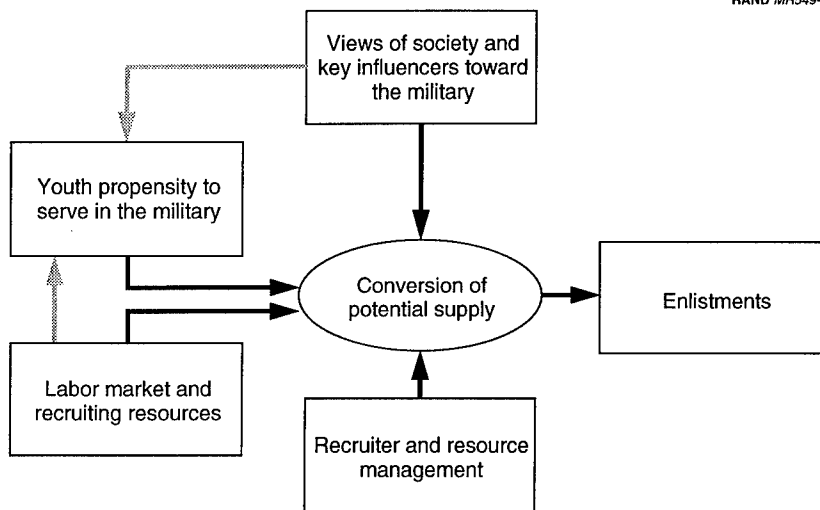


Figure 1—Conceptual View of Enlistment Process

service as well as labor market conditions and recruiting resource levels—such as advertising—that are known to predict the enlistment rate. These factors create potential supply. Research also has shown the importance of the supply conversion process, which determines how much of the potential supply is in fact captured. The conversion process is influenced by broad societal attitudes toward the role, relevance, and stability of the military as an institution, which affect the information youth will receive between the time they first consider enlistment and the time of their final decision about signing an enlistment contract, including what key influencers such as parents will tell youth about the desirability of joining the military. Finally, research has shown that recruiter and resource management practices such as the specific contract goals given to recruiters and the incentives provided for achieving these goals—demand factors—also are instrumental in converting potential supply into actual enlistments.

TRENDS IN PROPENSITY TO ENLIST

In our analysis of enlistment propensity, we first relate enlistment propensity to enlistment supply, then describe recent propensity trends, and, last, draw implications for the ease or difficulty of meeting recruiting goals.

Enlistment propensity is indicative of the potential supply of enlistees. The primary measures of propensity used by the Department of Defense are assessed in the Youth Attitude Tracking Study (YATS), an in-depth, computer-assisted telephone interview. The YATS began in fall 1975 as a semiannual survey of young men. It began including women and older age groups in fall 1980, at which time it became an annual survey. In addition to propensity, there is a great deal of other information relevant to recruiting collected in the YATS, including the following:

- Military advertising awareness.
- Military information-seeking, such as attempting to contact a recruiter, sending in a postcard, or making a call for information.
- Civilian employment and perceptions of the difficulty involved in entering the job market.
- Perceived characteristics of military jobs relative to civilian jobs and the importance of those characteristics.
- Reported attitudes of influencers such as parents, siblings, teachers, and friends toward enlistment.
- Demographic characteristics.

Since the YATS is administered annually, it provides information both on current data and trends in these areas.

Two kinds of questions in the YATS address propensity. The first is an “unaided mention” question that simply asks the respondent what he thinks he will be doing in the next few years. If he indicates he plans to join the military, then he is considered to have made an “unaided mention” of plans for military service. The mention is unaided because military service was not referred to by the interviewer—that is, the information was volunteered by the respondent.

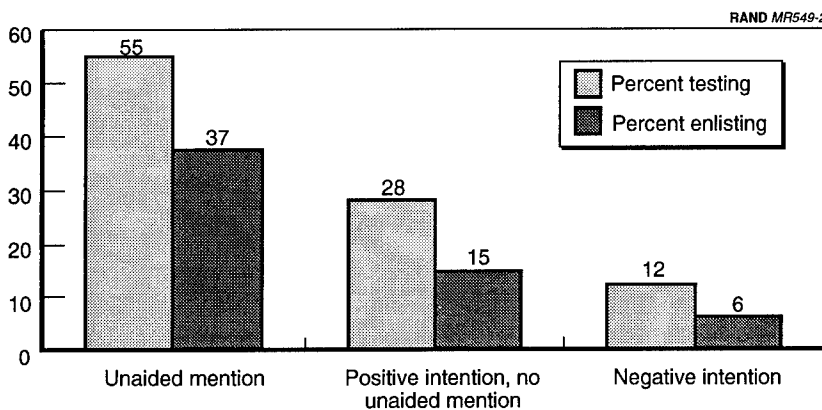
Second, there is a “general intention” question in the YATS that specifically asks respondents how likely it is that they will serve in the military in the next few years. They can reply “definitely,” “probably,” “probably not,” or “definitely not.” This question is asked with regard to joining the military in general and for each of the individual services. Normally, responses of “definitely” or “probably” are combined and called “positive propensity”; those of “probably not” or “definitely not” are combined and called “negative propensity.” Past research supports this combination of responses. First, the combined “definitely” and “probably” category provides a more valid indicator of prospective enlistment than do the two individual categories. Second, enlistment rates for persons stating “definitely not” or “probably not” are quite similar. Thus, it makes sense to combine these responses as well.¹

THE LINK BETWEEN STATED PROPENSITY AND THE PROBABILITY OF ENLISTING

Should we care about the responses to the enlistment propensity questions? Yes; analysis over many years has demonstrated the strong relationship between unaided mentions or positive propensity and the likelihood of enlistment.

¹The negative propensity group also contains the very small percentage of “don’t know” responses; such respondents enlist at a rate similar to that of other negative propensity respondents.

Figure 2 shows the percentage of young men taking the written test² to qualify for military service and their associated enlistment rate according to the strength of their intention to serve in the military. There is a statistically significant relationship between the strength of intention and actual enlistment behavior. For example, among those who made unaided mentions of plans for military service, the strongest indicator, we find that more than half took the written qualifying test and 37 percent enlisted. These rates fall by about half for persons who said that they definitely or probably would serve in the military but did not make unaided mentions. Finally, the rates decline to a small percentage for persons expressing negative intentions. The linkage between intention and enlistment is all the more



NOTE: The percentages are based on a 1984 follow-up of male respondents to the 1976–1980 YATS waves ($n = 33,809$) and are weighted to ensure representativeness.

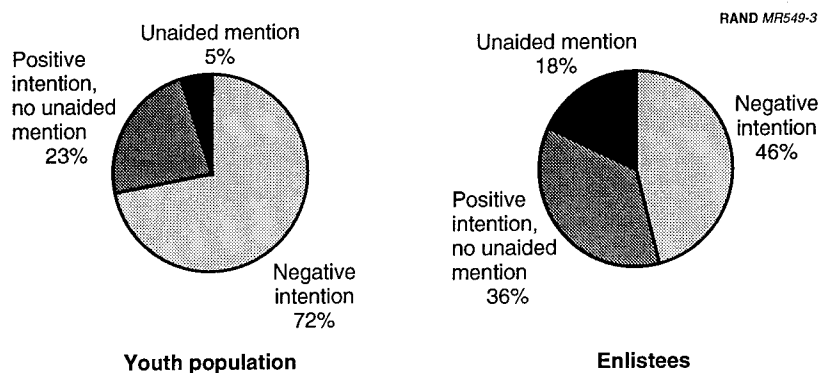
Figure 2—Military Testing and Enlistment Rates According to Self-Reported Intention Level

²The Armed Services Vocational Aptitude Battery (ASVAB) is administered to persons interested in qualifying for military service. The rates cited exclude institutional administrations arranged by schools, because the examinees may have little interest in enlisting.

impressive when we bear in mind that the respondents are quite young. Many of them are sophomores or juniors in high school who are being asked to predict a major decision that is at least two years in the future.

THE EFFECT OF CHANGES IN POSITIVE PROPENSITY LEVEL ON ENLISTMENT SUPPLY

As shown above, there is a strong relationship between intention level and enlistment. However, if our purpose is to relate changes in positive propensity levels to prospective changes in supply, that relationship is only part of the story. The other part has to do with the large size of the negative intention group and its implications. As shown in the left pie chart in Figure 3, the negative intention group comprises approximately three-fourths of the male youth population. Even though few of these persons enlist, as shown in Figure 2, the large size of the group enables it to account for about half of all enlistees. This can be seen in the right pie chart in Figure 3. Moreover, these results are for young men and for the military as a



NOTE: The percentages are based on a 1984 follow-up of male respondents to the 1976–1980 YATS waves ($n = 33,809$, $n = 3,259$ enlistees) and are weighted to ensure representativeness.

Figure 3—Distribution of Intentions in Youth Population and Among Enlistees

whole. In the case of propensity measures for young women or for individual services, the percentage of individuals in the negative intention group would be closer to 85–90 percent. Consequently, persons initially expressing negative intentions would account for two-thirds to three-fourths of the enlistees.

To get to the bottom line—the *change in enlistment supply due to a change in propensity level*—we now have two pieces that must be put together: On the one hand, we have the strong relationship between intention level and the likelihood of enlistment, which means that lower positive propensity levels will reduce enlistment supply. On the other, we have many enlistees expressing initial negative propensity. Lower positive propensity levels will *increase* the number of persons with negative propensity and, thus, the number of negative propensity enlistees. The net consequence is that enlistment supply will move up and down with the positive propensity level, but the movement will not be nearly as great as that of the positive propensity level itself. Given the typical levels of positive propensity found across the range of “general intention” measures assessed in the YATS and the associated enlistment rates among persons with positive and negative propensity, the impact on potential enlistment supply generally will be only 20 percent to 40 percent of the change in the positive propensity level.

This point is best demonstrated with an example. Suppose that 20 percent of youth express positive intentions to serve in the military and 80 percent express negative intentions. Now, assume that 19 percent of those expressing positive propensity eventually enlist, whereas only 6 percent of those expressing negative propensity do so. (These numbers are taken from Figure 2; the positive propensity figure represents the weighted average of the two positive intention groups.) The proportion that enlists out of the population represented by the survey sample is then:

$$(.20 \times .19) + (.80 \times .06) = .0860.$$

Now, what happens if the proportion of the population expressing positive propensity falls by 10 percent in relative terms, from .20 to .18? The new enlistment rate is calculated as

$$(.18 \times .19) + (.82 \times .06) = .0834.$$

The percentage decline in enlistment supply thus is

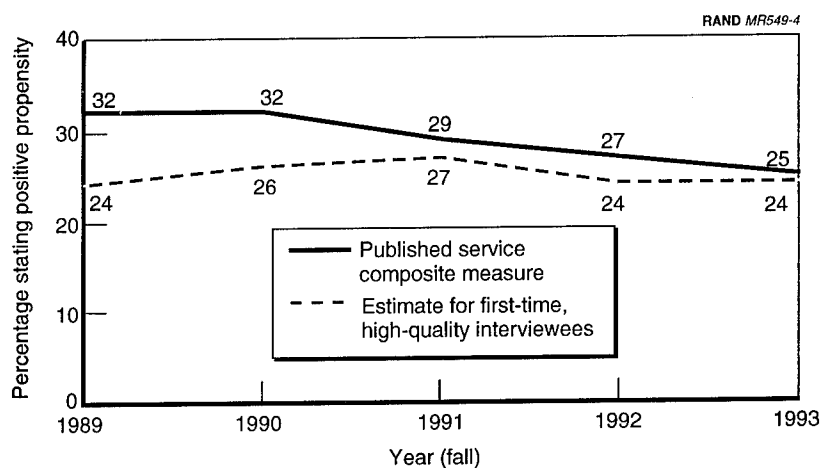
$$100\% \times (1 - .0834/.0860) = 3.0\%.$$

The enlistment supply thus drops only 3 percent as a result of the 10 percent drop in positive propensity.

RECENT TRENDS IN PROPENSITY TO SERVE IN THE MILITARY

We now examine recent trends in positive propensity rates. The reader should bear in mind that such changes translate to corresponding but smaller changes in expected enlistment supply, as just demonstrated.

Figure 4 shows results for the most widely known YATS propensity measure: composite active propensity. This measure represents the percentage of respondents indicating they are likely to serve in the



NOTE: The percentages are based on 2500–5000 cases per YATS wave. These are males 16–21 years of age who are not beyond their second year of college. The results are weighted to the age, race, and education characteristics of the 1993 male youth population to ensure representativeness.

Figure 4—Published and Reestimated Trends in Positive Propensity

military, based on their responses to four questions about serving specifically in the Army, Navy, Marine Corps, or Air Force. We use this measure to illustrate the following point: Our analysis suggests that the actual decline in propensity for the prime recruiting market is much smaller than the propensity decline reported in earlier YATS publications.

The figure covers the span from fall 1989—the end of the last pre-drawdown year—through fall 1993, the most current information in the YATS. The upper (solid) line shows the published numbers. It indicates a fairly sharp drop of 7 percentage points over this period (to 25 from the initial 32), or over 20 percent in relative terms. However, there is reason to believe that the true propensity decrease is less serious than that shown, at least in regard to the population of most interest to DoD. The lower line shows recomputed estimates that we believe are more relevant.

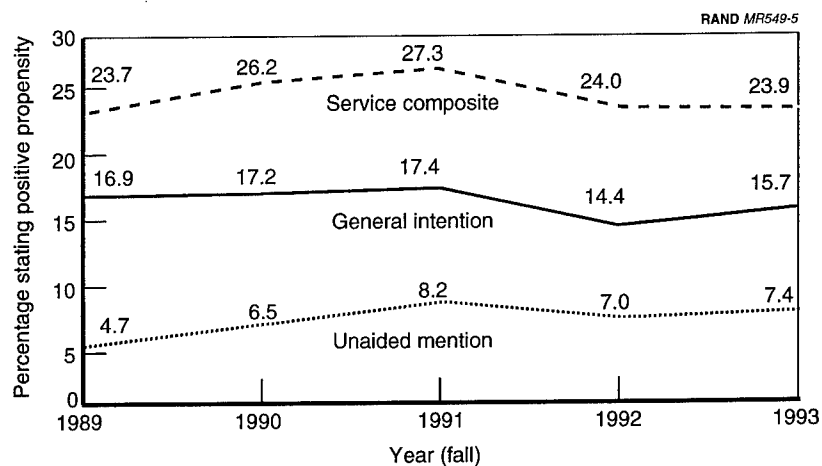
The reanalysis differs in two ways from the published numbers. First, the estimates are for high-quality youth,³ the prime recruiting market. This means that the numbers overall will be lower than they would be for the full population, because high-quality youth have lower propensity to serve in the military than do lower-quality youth. Our analysis also reveals that the propensity levels reported in the YATS since the beginning of the drawdown have declined less among high-quality youth than among lower-quality youth.

A second way the recomputation differs from the original is that it adjusts for a sampling difference in the YATS that began in 1991. Prior to that time, all YATS respondents were first-time interviewees. But beginning in 1991, about half the sample consists of reinterviewees—i.e., persons originally interviewed in the immediately preceding YATS wave(s). There are both statistical reasons (involving precision of estimation) and budgetary reasons for that

³The rate is estimated by weighting the YATS results according to information on demographic characteristics and academic achievement provided by the respondents. These factors are known to be related to AFQT scores in specific ways. For simplicity, this report uses the term “high-quality” rather than “AFQT Category I-III A” youth. The latter is technically correct, but the distinction is of limited practical significance since the overwhelming majority of youth likely to score in the upper half of the AFQT distribution (Category I-III A) also graduate from high school, thereby meeting both high-quality criteria.

sampling approach. It turns out, however, that the YATS reinterviewees expressed significantly lower propensity than the first-time interviewees. It is not yet clear why this unexpected result occurred. The Office of Accession Policy within the Office of the Secretary of Defense (OSD) is directing research to explain this phenomenon and to develop a final set of propensity numbers. We employ the estimates we believe to be the best now available that provide a standard of comparison across the years for the prime market: high-quality estimates based only on first-time interviewees.

Using the reestimation procedure, Figure 5 shows the positive propensity rates from 1989 to 1993 for the three types of measures discussed earlier: the composite active propensity measure, the general intention question, and the unaided mention question. These measures are independent, relying on different questions in the YATS; hence, the average positive propensity level differs for the three measures. The focus of the analysis concerns the assessment of propensity trends over time and their consistency across the three measures. Overall, the trend is quite consistent for the three mea-



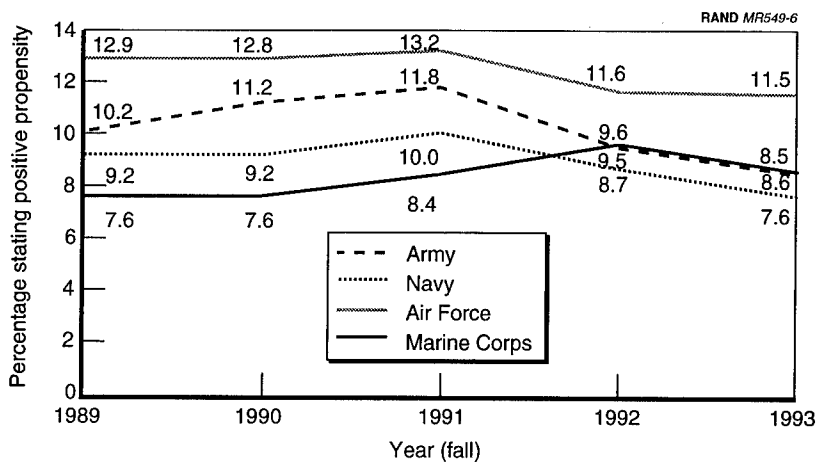
NOTE: The percentages are based on 2500–5000 cases per YATS wave. These are males 16–21 years of age who are not beyond their second year of college. The results are weighted to the age, race, and education characteristics of the 1993 male youth population to ensure representativeness.

Figure 5—Positive Propensity Trends for High-Quality Youth

tures. It indicates that propensity tended to increase during the early portion of the period. It then declined between 1991 and 1992, as the Persian Gulf war ended and recruiting resources continued to be reduced in connection with the drawdown. Finally, propensity tended to level off or increase slightly between 1992 and 1993. Of greatest importance, this placed the 1993 rates on all the measures near or above those of the late 1980s when recruiting was good. (The 1980s rates for most measures peaked in 1989.)

The general intention measure, shown in the middle, reflects a slight decline in positive propensity, to 15.7 percent from 16.9 percent. Based on our past research examining the relationship between intention responses and enlistment rates, we believe that this measure provides the best overall DoD propensity estimate of the three measures. The decline of 1.2 percentage points represents a 7 percent reduction in positive propensity in relative terms.

The propensity trends vary by service (see Figure 6). For example, among high-quality youth, the percentage of YATS respondents



NOTE: The percentages are based on 2500–5000 cases per YATS wave. These are males 16–21 years of age who are not beyond their second year of college. The results are weighted to the age, race, and education characteristics of the 1993 male youth population to ensure representativeness.

Figure 6—Positive Propensity Trends by Service

stating positive propensity to serve in the Marine Corps increased between 1989 and 1993, from about 7.6 percent to about 8.6 percent. In contrast, the other three services show some decline in propensity; in relative terms, the decline generally amounts to about 10 to 15 percent of the 1989 rate.

IMPLICATIONS FOR RECRUITING SUCCESS

We now translate the overall and service-specific propensity trends into their implications for the ability of DoD and the services to meet their recruiting goals. Consistent with the earlier discussion, given these trends—which amount to about a 15 percent decline at worst—we would not expect the downturn in supply to exceed 5 percent. This is much less than the drawdown in end strength, suggesting that potential enlistment supply should be adequate. We evaluate the adequacy of supply more systematically below.

We begin by estimating the overall high-quality enlistment rate, using the calculation shown earlier: the proportion of persons expressing positive propensity times their expected enlistment rate, plus the proportion expressing negative propensity times their expected enlistment rate.

To enable meaningful year-to-year comparisons, we need to incorporate information on the size of the population that the enlistment rate applies to (which changes from year to year)⁴ and on the accession requirement for high-quality nonprior-service (NPS) personnel for that year. We thus formulate the following ratio:

$$\frac{\text{youth population} \times \text{overall enlistment rate}}{\text{high-quality accession requirement}} .$$

The higher this supply-to-requirement ratio, the more favorable the recruiting environment.

⁴We use census figures for the male youth population 16–21 years of age. We did not have reliable population figures for the subset of high-quality youth. This difference should have little effect, if any, on the ratio of current (or near-term) supply to 1989 supply—not only is the change in population small over this period, but the trend should be highly similar for the two groups.

We are less interested in the value of this ratio for any given year than in trends in the ratio over time. We are particularly interested in the current year and in 1996 because of the higher requirement in that year. We will compare these years with the 1989 (predrawdown) enlistment supply, accounting for the difference in the high-quality NPS accession requirement. This amounts to taking the ratio calculated for the new year (e.g., 1994) and dividing it by the analogous ratio for 1989. That compares the potential supply of enlistees for the two years while adjusting for differences in the accession requirement. In such comparisons, a quotient bigger than 1.0 indicates that things are getting better, that is, that supply is increasing relative to the requirement. If the quotient falls below 1.0, it indicates that things are getting harder, that is, that supply is decreasing relative to the requirement.

In calculating these quotients for 1994 and 1996 (see Table 1), we found that prospective supply equals or exceeds its predrawdown levels relative to the requirement for high-quality NPS accessions, implying there should be an adequate potential supply. For example, in 1994 (the first row of the table) the computed supply ratio relative to 1989 for DoD as a whole is about 1.2, representing roughly a 20 percent increase in prospective supply relative to the requirement. We also find that the ratios for the individual services are above 1.0, except for that of the Marine Corps, whose ratio of 1.0 reflects the relative constancy of its recruiting mission across this period.

Table 1
Enlistment Supply-to-Demand Ratio, Relative to 1989

Year	Service				
	DoD	Army	Navy	Marine Corps	Air Force
1994	1.2	1.3	1.1	1.0	1.3
1996	1.1	1.1	1.2	1.0	1.1

NOTE: Each number is the ratio of enlistment supply to accession requirement for 1994 (or 1996) divided by the analogous ratio for 1989.

For the 1996 computation (second row), we again used the current (latest) levels of propensity, in effect assuming that propensity remains about the same over the next two years. As compared with 1994, the ratios generally drop as we move to 1996. This drop reflects the increased number of high-quality accessions required in the postdrawdown period. However, the ratios all remain at about 1.0 or greater, which again would suggest that prospective supply should be adequate, equaling or exceeding its predrawdown levels relative to the requirement.

DETERMINANTS OF ENLISTMENT SUPPLY

We now analyze specific determinants of enlistment supply. We begin by identifying the various determinants and drawing from past research to examine how they relate to recruiting success. We then discuss factors other than effectiveness that must be considered in fashioning policy from these determinants. Finally, we look at recent trends in the determinants and the implications of those trends for enlistment supply.

ENLISTMENT DETERMINANTS

Many factors underlie enlistment outcomes. Generally speaking, enlistments can be thought of as being the result of the interaction of supply and demand. On the *supply* side, the following factors play a role:

- The size of the youth population and its quality composition, that is, the fraction that are high school graduates and who would score in the upper half of the AFQT test score distribution.
- Recruiting resources. These include recruiters, advertising, and the various enlistment incentives that the services target toward recruits, such as the GI Bill, enlistment bonuses, and the Army College Fund (ACF).
- Civilian opportunities. These represent the opportunities that potential enlistees have outside the military such as schooling and financial aid opportunities, job opportunities (as summarized by civilian pay relative to military pay and the youth un-

employment rate), and job security in the military versus the civilian sector.

As noted earlier, societal attitudes toward the military also affect enlistment outcomes because they affect the conversion of the supply factors into actual enlistments.

Although they may be the most obvious ones, supply factors are not the only determinants of enlistments. There also are demand factors, by which we mean factors that the services and the various recruiting commands can influence. For example, the services can influence the contract attributes that are available to youth. Such attributes include the occupations or occupational groups that individuals can enter, the numbers of years for which they can enlist, overseas assignment opportunities, whether they have a choice of station, and the like.

Other demand factors relate to the management of recruiting resources. They include the following:

- The allocation of recruiting resources. For example, the recruiting commands must decide where to geographically locate recruiters throughout the country. The services must decide which advertising media mix to use, what the advertising message should be, whom the message should target, and so forth.
- Methods to motivate effort and productivity among the recruiting workforce. Among these are recruiter quotas, which are monthly missions for quantity and quality. These missions are tied to the recruiting command's annual accession goal. The recruiting commands may also have recruiter missions for prior-service versus nonprior-service personnel and for males versus females. Many recruiting personnel are managed by incentive plans. Under these plans, personnel accumulate points for various aspects of their productivity. The points can then lead to various awards, such as certificates, badges, and sometimes even improved promotion chances.

HOW THE DETERMINANTS AFFECT ENLISTMENTS

Having said something about the determinants of enlistment, we now examine what the trends in enlistments have been. Figure 7 shows Army nonprior-service accessions over most of the All Volunteer Force period. The first point to notice is that in the late 1970s and particularly in the early 1980s, there was a quality crisis. Recruit quality during this period was extremely low. For example, in 1980, only 15 percent of all Army nonprior-service accessions were high quality. In contrast, in 1993 this figure was 66 percent. Quality rose substantially over the early 1980s, and by 1986 the quality crisis was largely over. In the 1990s, one can see evidence of the draw-down. Accessions have declined. However, quality levels have been relatively constant. Thus, most of the drawdown cuts have been in terms of low-quality enlistments.

The rise in quality was associated with a variety of programs and policies. Between 1980 and 1983, military pay rose by 33 percent. The Army College Fund was introduced in 1982, and the enlistment bonus program was significantly expanded. In 1985, the Montgomery GI Bill began. Such policy changes were in part the results of studies quantifying the effects of enlistment determinants and provided data for further research. These studies included several carefully controlled national experiments. For example, in 1981 RAND conducted the Educational Assistance Test Program, in which the country was divided into a control cell and three test cells. As part of this experiment, the RAND study team examined the effect on enlistments of varying the structure of educational benefits. Out of this experiment, the Army College Fund was born in 1982. Between 1982 and 1984, RAND conducted the Enlistment Bonus Test, which estimated the effects of enlistment bonuses on high-quality enlistments as well as on enlistments into hard-to-fill occupations. In 1984, the Advertising Mix Test was conducted, in which the effects of service and joint service advertising were estimated.

We also have been able to estimate the effects on enlistment supply of such determinants as military pay, recruiters, and the youth unemployment rate. Finally, we have studied the role of recruiter management, including the effects of recruiter incentives on enlistment supply.

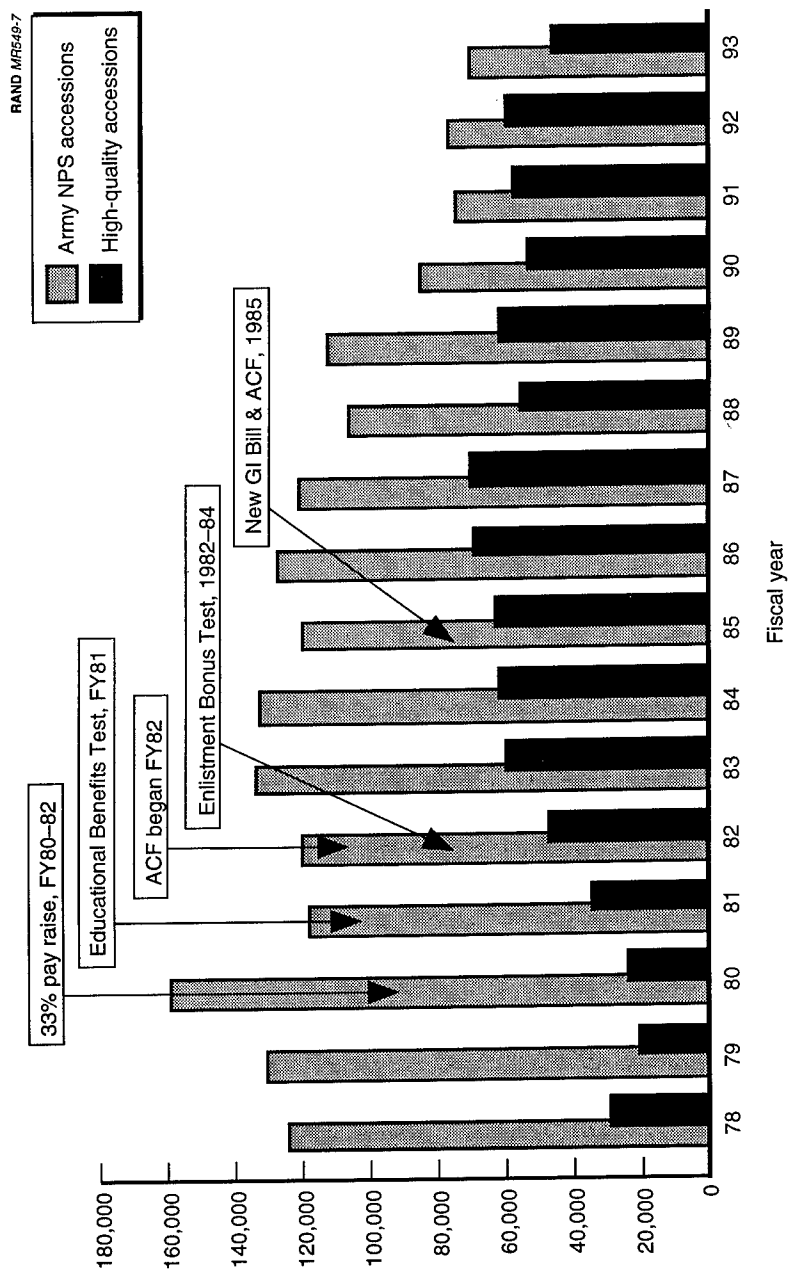


Figure 7—Enlistment Trends Since Fiscal Year 1978

The main output of these studies has been an estimate of the effect of each determinant on high-quality enlistments. We define the estimated effect as the percentage change in enlistments resulting from a percentage change in a determinant.

Table 2 shows the estimated effect of a 10 percent increase in each supply determinant on Army high-quality enlistments. Later in this chapter, we will use these figures to estimate how recent changes in the levels of the determinants would be expected to affect enlistment supply. The figures are taken from representative studies. Other studies provide somewhat different estimates because they may use different data, cover different time periods, or use somewhat different estimation methods. But a consensus can be found among the studies: The unemployment rate, recruiters, and military pay growth (relative to civilian pay growth) have the largest estimated effects. In the case of recruiters, for example, a 10 percent increase in recruiters results in a 6 percent increase in high-quality Army enlistments.

The last two figures in the table show the effects of advertising. These are short-run enlistment effects because they show the effect on enlistments *in a given month* of a 10 percent increase in advertising. However, available evidence shows that the effects of advertising persist over time, so that a one-time change in advertising during a given month induces increased enlistments for as long as six months (Dertouzos and Polich, 1989). Because of these time-

Table 2
Estimated Increase in High-Quality Recruits Resulting
from a 10 Percent Increase in Supply Factors

Factor	Percentage Increase in Enlistments
Unemployment rate	9.42
Youth population	2.40
Recruiters	5.97
Relative military pay growth	5.47
Army College Fund	1.70
Enlistment bonus program	0.70
National advertising	0.56
Local advertising	0.13

NOTE: Estimates hold recruiter effort constant.

persistent effects, the long-run increase in enlistments is 1.4 times the short-run effect, implying that the total effect of an increase in advertising expenditures is 2.4 times the initial effect. Therefore, the total increase in high-quality Army enlistments as a result of a 10 percent increase in national advertising and in local advertising is 1.34 percent and .34 percent, respectively.¹

The last six factors represent various recruiting resources. As can be seen, pay and recruiters have large estimated effects, whereas advertising, even including the long-run effect of advertising, has small effects. Further, the Army College Fund is estimated to have a bigger market expansion effect than enlistment bonuses. Pay has a relatively large estimated effect. However, it should not be inferred that more resources should be necessarily directed toward pay. Other factors need to be considered; among the most important is cost.

OTHER FACTORS AFFECTING THE OPTIMAL MIX OF RECRUITING RESOURCES

Table 3 shows estimates of how much extra must be expended on each of several recruiting resources to gain an additional high-quality recruit—the marginal cost of each of the recruiting resources. The marginal cost estimates indicate the relative cost-effectiveness of each resource. As can be seen, pay is a relatively costly recruiting resource. To increase high-quality enlistments through pay, DoD must not only pay the new high-quality enlistees who are brought in, but also increase the pay of the high-quality enlistees who would have come in even without the pay increase. Furthermore, DoD must give the pay increase to low-quality enlistees, individuals who are not the targets of the pay increase. On the other hand, recruiters and advertising are very cost-effective, as are educational benefits.

In Table 3, we measure cost-effectiveness in terms of the effect on the number of high-quality recruits who enter service. But we can measure effectiveness in other ways. For example, enlistment bonuses are known to be very effective in channeling recruits into

¹Previous analysis (Dertouzos, 1989b) shows that there are interservice effects of advertising expenditures. Owing to their complexity, these interservice effects are ignored in this analysis.

Table 3
Estimated Marginal Cost of a High-Quality Recruit
Using Alternative Recruiting Resources

Resource	Marginal Cost (\$)
Education benefits	7,000
Recruiters	7,300
Advertising	8,100
Enlistment bonuses	18,600
Entry basic pay	34,800

hard-to-fill skills such as combat arms. Educational benefits can reduce first-term attrition and increase the supply of prior-service individuals to the reserve components. Pay deals with equity issues. Thus, if we change the definition of effectiveness, we might get a different ordering of the cost-effectiveness of recruiting resources.

Recruiting resources are not the only tool at the disposal of the recruiting commands. The commands can also influence the effort and productivity of the personnel working at the commands and how they are managed—the demand factors described earlier. Research shows that to help ensure the maximum effectiveness of a change in recruiting resources, such as in advertising or pay, recruiting personnel must be managed so that their incentives are consistent with the resource change.

We have found that quotas and incentive plans are important in determining enlistment success. For example, we estimate that when a resource such as advertising is increased to obtain a 10 percent increase in high-quality enlistments, the recruiting command will get only a 7 percent increase (or 70 percent of its target) if it does not simultaneously increase the recruiter's high-quality enlistment quota. The reason is that when advertising increases and the market expands, the recruiter's job is now easier and he or she will reduce effort.

Our analysis also indicates that recruiters will substitute low-quality enlistments for high-quality enlistments unless they have incentives to focus on high quality, because the low-quality enlistments are much easier to obtain. Furthermore, the success of such programs as educational benefits and enlistment bonuses depends on the

points and awards embedded in recruiting incentive plans, because recruiting personnel behavior is sensitive to the structure of these plans.

TRENDS IN ENLISTMENT DETERMINANTS AND THEIR IMPLICATIONS

We now turn to changes in the levels of supply and demand determinants since the beginning of the drawdown. As shown in Table 4, the youth population has declined roughly 7 percent, Army production recruiters have dropped by nearly 25 percent, and Army national and local advertising has dropped precipitously. On the other hand, working in favor of recruiting has been the fact that the youth unemployment rate has risen almost 27 percent since 1989 and pay for youth in the military has grown 7 percent faster than pay for their civilian counterparts.

On the demand side, we know there has been a significant cut in low-quality quotas. In the Army, low-quality enlistments dropped nearly 60 percent between 1989 and 1993. This cut allowed recruiters to redirect their time and effort toward high-quality enlistments. However, at this point, there is a lot we do not know about how de-

Table 4
Recent Changes in Factors Affecting Enlistment

Factor	Change FY89–FY93 (%)
Supply	
Youth unemployment rate	26.7
Youth population	–6.8
Army production recruiters	–24.6
Relative military pay growth ^a	7.0
Army national advertising ^b	–54.6
Army local advertising ^b	–68.6
Demand	
Low-quality enlistments	–56.8
Resource management	?
Recruiter management	?

^aChange from 1989 to 1992.

^bConstant 1990 dollars.

mand factors such as personnel and resource management have changed.

Multiplying the percentages in Table 4 by the effects in Table 2 (times 0.1) gives the estimated effect on enlistment supply of the change between 1989 and 1993 in the value of each factor (see Table 5). If we add up the estimated effects resulting from changes in *supply* factors, we get a positive number—3.3 percent. In other words, we predict that potential supply should have been slightly greater in 1993 than at the beginning of the drawdown. Thus, recruiting is predicted to be somewhat easier in 1993 relative to the beginning of the drawdown.

As noted above, the numbers shown in Table 2 are representative, but there is also evidence to support different values. We have found, however, that the sign of the result is insensitive to the estimates we used. If we use alternate values from other studies, we continue to get a positive number.

Therefore, we do not expect recruiting difficulties on the basis of the changes in resources, the economy, and the other supply factors we

Table 5
Implications of Recent Factor Changes for High-Quality
Army Recruiting

Factor	Estimated Change in Recruits (%)
Supply	
Youth unemployment rate	25.1
Youth population	-1.6
Army production recruiters	-14.7
Relative military pay growth ^a	3.8
Army national advertising ^b	-7.4
Army local advertising ^b	-1.9
Sum of supply factor effects	3.3
Demand	
Low-quality enlistments	17.5
Resource management	?
Recruiter management	?
Sum of all factor effects	20.8

^aChange from 1989 to 1992.

^bConstant 1990 dollars.

have been able to examine. And, when we consider the demand factors for which we have information, the sum of the effects is 20.8 percent. Thus, recruiting should have become significantly easier, rather than more difficult.

These results are derived using recruiting resource data for the Army—the data currently available. We believe they are likely to generalize to the other services because changes in the youth labor market and the decline in recruiting resources during the drawdown have been common to all of the services.

Of course, we do not yet know how recruiter and resource management have changed since the beginning of the drawdown. Such changes may explain the difficulties that the recruiting commands are experiencing.

CONCLUSIONS AND RECOMMENDATIONS

Our analyses of changes in stated enlistment propensity and in the levels of supply and demand determinants are consistent in suggesting that there should be an adequate supply of potential enlistees. Indeed, accession and quality goals are being met, but the services report that meeting these targets is getting more difficult. Why is this the case?

We see two possible explanations. The first is that underlying attitudes toward the military could have changed as a result of Operation Desert Shield/Storm, the end of the Cold War, and the defense drawdown. If real, such changes might cause a paradigm shift in our models, so that the effects of the various enlistment determinants that we estimate are different now. Thus, we might overestimate supply. Although we still need more information on how attitudes (and thus our estimates) may have changed, we do not view lower potential supply as the likely reason for reported recruiting difficulties. For one thing, there has been a substantial reduction in the annual high-quality accession requirement since the late 1980s. Also, the enlistment models we used to estimate changes in supply were developed over many years and economic conditions, and we thus believe they are robust. To offset the large positive effects on high-quality recruiting predicted by these models as a result of the recession and the shift away from low-quality enlistments, the magnitude of the attitude change (and resulting paradigm shift) would have to be very large. An attitude change of this magnitude should be reflected in the propensity figures for high-quality youth, yet we do not find evidence of a major decline in high-quality propensity since the beginning of the drawdown.

The second, more likely explanation for the reported recruiting difficulties is that important changes in resource management or recruiting practices could have occurred as recruiting resources were substantially reduced during the drawdown. For example, it is likely that the reduced number of recruiters has imposed limits on the geographical areas they can cover or the contacts they can make, including those with key influencers. In turn, this could have had adverse effects on the feedback given to youth who are considering enlisting. Because demand factors play a significant role in determining enlistments, such changes could contribute in important ways to the difficulties now being reported.

Within the coming year, we plan to examine how these demand factors have changed. This will include interviewing key recruiting personnel, analyzing the results of DoD recruiter surveys, and looking at changes in the management of recruiting personnel such as changes in mission and incentive plans. In addition, we will conduct survey data analyses to update our information on changes in the attitudes of youth and key influencers toward the military and on the linkages between these attitudes and enlistment. We also plan to estimate new models of enlistment supply, building on earlier models and incorporating new estimation methods. Overall, the goal of this further research is to identify the likely recruiting conditions over the next few years and the policies and resources required to meet future recruiting goals.

Meanwhile, although we do not currently see shortages in the *potential* supply of enlistees, the reported difficulties in recruiting suggest that a hedging strategy is needed to ensure that the proper resources are in place to meet the coming increases in the accession mission. Our research supports increases in advertising and the removal of the ceiling on the number of recruiters. Such changes provide flexibility. Moreover, as shown earlier, our research indicates that advertising and recruiters are highly cost-effective recruiting resources. As part of these policies, the implementation and the effects of any increases in advertising or in the number of recruiters should be carefully monitored to ensure the cost-effectiveness of this policy response.

BIBLIOGRAPHY

- Asch, Beth J., and Lynn A. Karoly, *The Role of the Job Counselor in the Military Enlistment Process*, RAND, MR-315-OSD, 1993.
- Asch, Beth J., *Navy Recruiter Productivity and the Freeman Plan*, RAND, R-3713-FMP, June 1990.
- Ajzen, Icek, and Martin Fishbein, *Understanding Attitudes and Predicting Social Behavior*, Prentice-Hall, Englewood Cliffs, New Jersey, 1980.
- Bentler, Peter M., and G. Speckart, "Attitudes Cause Behaviors: A Structural Equation Analysis," *Journal of Personality and Social Psychology*, Vol. 40, 1981, pp. 226-238.
- Bentler, Peter M., and G. Speckart, "Models of Attitude-Behavior Relations," *Psychological Review*, Vol. 86, 1979, pp. 452-464.
- Berner, J. Kevin, and Thomas V. Daula, *Recruiting Goals, Regime Shifts, and the Supply of Labor to the Army*, U.S. Military Academy, working draft, February 1993.
- Berryman, S. E., R. M. Bell, and W. Lisowski, *The Military Enlistment Process: What Happens and Can It Be Improved?* RAND, R-2986-MRAL, May 1983.
- Brown, C., "Military Enlistments: What Can We Learn from Geographic Variations?" *American Economic Review*, Vol. 75, 1985, pp. 228-234.

Brunner, G. L., *The Importance of Volunteer Status: An Analysis and Reliability Test of Survey Data*, RAND, R-717-PR, December 1971.

Buddin, Richard, *Analysis of Early Military Attrition Behavior*, RAND, R-3069-MIL, July 1984.

Chow, Winston K., and J. Michael Polich, *Models of the First-Term Reenlistment Decision*, RAND, R-2468-MRAL, September 1980.

Congressional Budget Office, *Quality Soldiers: Costs of Manning the Active Army*, U.S. Congress, Washington, D.C., 1986.

Cotterman, Robert F., *Forecasting Enlistment Supply: A Time Series of Cross Sections Model*, RAND, R-3252-FMP, July 1986.

Daula, T. V., and D. A. Smith, "Recruiting Goals, Enlistment Supply, and Enlistments in the U.S. Army," in C. L. Gilroy (ed.), *Army Manpower Economics*, Westview Press, Boulder, Colorado, 1986, pp. 101-123.

Daula, Thomas V., and D. Alton Smith, "Estimating Enlistment Models for the U.S. Army," in *Research in Labor Economics*, Vol. 7, JAI Press, Greenwich, Connecticut, 1985, pp. 261-310.

Davidson, Andrew R., and James J. Jaccard, "Population Psychology: A New Look at an Old Problem," *Journal of Personality and Social Psychology*, Vol. 31, 1975, pp. 1073-1082.

Dertouzos, J. N. and J. M. Polich, *Recruiting Effects of Army Advertising*, RAND, R-3577-FMP, January 1989a.

Dertouzos, J. N., *The Effects of Military Advertising: Evidence from the Advertising Mix Test*, RAND, N-2907-FMP, March 1989b.

Dertouzos, J. N., *Recruiter Incentives and Enlistment Supply*, RAND, R-3065-MIL, May 1985.

Fernandez, R. L., *Enlistment Effects and Policy Implications of the Educational Assistance Test Program*, RAND, R-2935-MRAL, September 1982.

Fishbein, Martin, and Icek Ajzen, *Belief, Attitude, Intention and Behavior: An Introduction to Theory and Research*, Addison-Wesley, Reading, Massachusetts, 1975.

- Fiske, Susan T., and Shelley E. Taylor, *Social Cognition*, Addison-Wesley, Reading, Massachusetts, 1984.
- Fredericks, A. J., and D. L. Dossett, "Attitude-Behavior Relations: A Comparison of the Fishbein-Ajzen and the Bentler-Speckart Models," *Journal of Personality and Social Psychology*, Vol. 45, 1983, pp. 501-512.
- Haggstrom, G. W., *Logistic Regression and Discriminant Analysis by Ordinary Least Squares*, RAND, P-6811, March 1982.
- Heckman, J. J., "The Common Structure of Statistical Models of Truncation, Sample Selection, and Limited Dependent Variables, and a Simple Estimator for Such Models," *Annals of Economic and Social Measurement*, Vol. 5, 1976, pp. 475-492.
- Hiller, John R., *Analysis of Second-Term Reenlistment Behavior*, RAND, R-2884-MRAL, September 1982.
- Hom, P. W., and C. L. Hulin, "A Competitive Test of the Prediction of Reenlistment by Several Models," *Journal of Applied Psychology*, Vol. 66, 1981, pp. 23-29.
- Hom, P. W., R. Katerberg, and C. L. Hulin, "Comparative Examination of Three Approaches to the Prediction of Turnover," *Journal of Applied Psychology*, Vol. 64, 1979, pp. 280-290.
- Hosek, J. R., and C. E. Peterson, *Enlistment Decisions of Young Men*, RAND, R-3238-MIL, July 1985.
- Jaccard, James, and Andrew R. Davidson, "A Comparison of Two Models of Social Behavior: Results of a Survey Sample," *Sociometry*, Vol. 38, No. 4, 1975, pp. 497-517.
- Juster, Thomas F., *Anticipations and Purchases: An Analysis of Consumer Behavior*, Princeton University Press, Princeton, New Jersey, 1964.
- Keenan, K. M., "Reasons for Joining and Early Termination of Service in WRAC," in M. Tuck (ed.), *How Do We Choose? A Study in Consumer Behavior*, Methuen, London, 1976.
- Kmenta, J., *Elements of Econometrics*, Macmillan, New York, 1971.

Maddala, G. S., *Limited-Dependent and Qualitative Variables in Econometrics*, Cambridge University Press, Cambridge, England, 1983.

Mare, Robert D., Christopher Winship, and Warren N. Kubitschek, "The Transition from Youth to Adult: Understanding the Age Pattern of Employment," *American Journal of Sociology*, Vol. 90, 1984, pp. 326-358.

Market Facts, Inc., *Youth Attitude Tracking Study*, Spring 1976-Fall 1982 Reports, August 1976-May 1983.

Office of the Assistant Secretary of Defense for Manpower, Reserve Affairs, and Logistics, *Profile of American Youth: 1980 Nationwide Administration of the Armed Services Vocational Aptitude Battery*, Washington, D.C., 1982.

Olsen, R. J., "A Least Squares Correction for Selectivity Bias," *Econometrica*, Vol. 48, 1980, pp. 1815-1820.

Orkand Corporation, *Parents' Perceptions of Their Influence on Youths' Enlistment Decisions*, Office of the Assistant Secretary of Defense for Manpower, Reserve Affairs, and Logistics, March 1983.

Orvis, Bruce R., Martin T. Gahart, Alvin K. Ludwig, with Karl F. Schutz, *Validity and Usefulness of Enlistment Intention Information*, RAND, R-3775-FMP, 1992

Orvis, Bruce R., and Martin T. Gahart, with Karl F. Schutz, *Enlistment Among Applicants for Military Service: Determinants and Incentives*, RAND, R-3359-FMP, January 1990.

Orvis, Bruce R., and Martin T. Gahart, *Quality-Based Analysis Capability for National Youth Surveys*, RAND, R-3675-FMP, March 1989.

Orvis, Bruce R., *Relationship of Enlistment Intentions to Enlistment in Active Duty Services*, RAND, N-2411-FMP, September 1986.

Orvis, Bruce R., and M. T. Gahart, *Relationship of Enlistment Intention and Market Survey Information to Enlistment in Active Duty Military Service*, RAND, N-2292-MIL, June 1985.

Orvis, Bruce R., *Analysis of Youth Cohort Enlistment Intention Data: Progress Report*, RAND, N-2076-MIL, April 1984.

Orvis, Bruce R., *Forecasting Enlistment Actions from Intention Information: Validity and Improvement*, RAND, N-1954-MRAL, December 1982.

Polich, J. M., James N. Dertouzos, and S. James Press, *The Enlistment Bonus Experiment*, RAND, R-3353-FMP, April 1986.

Pomazal, Richard J., and James J. Jaccard, "An Informational Approach to Altruistic Behavior," *Journal of Personality and Social Psychology*, Vol. 33, 1976, pp. 317-326.

Research Triangle Institute, *Youth Attitude Tracking Study II, Fall 1983-Fall 1989*, North Carolina, 1984-1990.

Schutz, K. F., *A Practical Guide to MAXLIK*, RAND, N-1914-RC, October 1983.

Sheppard, B. H., J. Hartwick, and P. R. Warshaw, "The Theory of Reasoned Action: A Meta-Analysis of Past Research with Recommendations for Modifications and Future Research," *Journal of Consumer Research*, Vol. 15, 1988, pp. 325-343.

Smith, D. Alton, Paul Hogan, and Lawrence Goldberg, *Army College Fund Cost-Effectiveness Study*, United States Army Recruiting Command, Report SR 90-5, Fort Sheridan, Illinois, November 1990.

Westat, Inc., *Youth Attitude Tracking Study III, Fall 1990-Fall 1993*, Rockville, Maryland, 1991-1994.